

NOTES ON THE GROWTH OF TAXONOMIC KNOWLEDGE OF THE
PSOCOPTERA AND ON THE GRAMMAR OF THE
NOMENCLATURE OF THE ORDER

GEORGE C. STEYSKAL

Systematic Entomology Laboratory, Agricultural Research Service, USDA,
c o U. S. National Museum, Washington, D. C. 20560

ABSTRACT—A growth curve is plotted for the accumulation of species descriptions in the Psocoptera, resulting in an indication that about half the total number of extant species has been described. The number of species per genus is also plotted against the number of genera with each number of species. The average number of species per genus is 8.27. The grammar of the nomenclature of the latest general catalog is discussed.

The data in the world catalogue of the Psocoptera by Smithers (1967) were made the subject of a trend curve analysis according to a method I have described (Steyskal, 1965), whereby an attempt is made to gain an insight by statistical means into the relative completeness of our knowledge of the existing species of a taxonomic group. I have shown that when a group is well known, that is, when the primary work of species description is nearly completed, the plotting of accumulated numbers of presently valid species against periods of years (decades) within which the species were described will usually yield a smooth sigmoid curve. Many groups of insects, when thus analyzed, give a smooth curve, but one that is only the lower 1/2 of a sigma. This may be taken to indicate that the rate of species description has not begun to slacken, and that many species (very roughly 1/2 of those extant) remain undescribed. The larger the group analyzed the smoother is the resulting curve. The Psocoptera, with a total of 1565 recent species described and held valid in 1965, are of a size that may be expected to produce a good curve, one with no dots far from a smoothly curved line.

Starting with the 2 species described by Linnaeus in 1758, the Psocoptera give the curve shown in Figure 1, one that is smooth but far from sigmoid. It is evident therefrom that species description has not yet definitely passed midpoint, beyond which, as shown by the extrapolated broken line, the curve should start to turn to the right as accumulated numbers of species lessen. The extrapolated curve may be considered minimal, inasmuch as one of the effects of the publication of a catalogue is often that of increased taxonomic activity. It is not at all surprising that the alpha taxonomy of insects as delicate and inconspicuous as the Psocoptera should have been so slow in gaining impetus. Even the workers most familiar with any particular group cannot with any degree of exactness tell at what

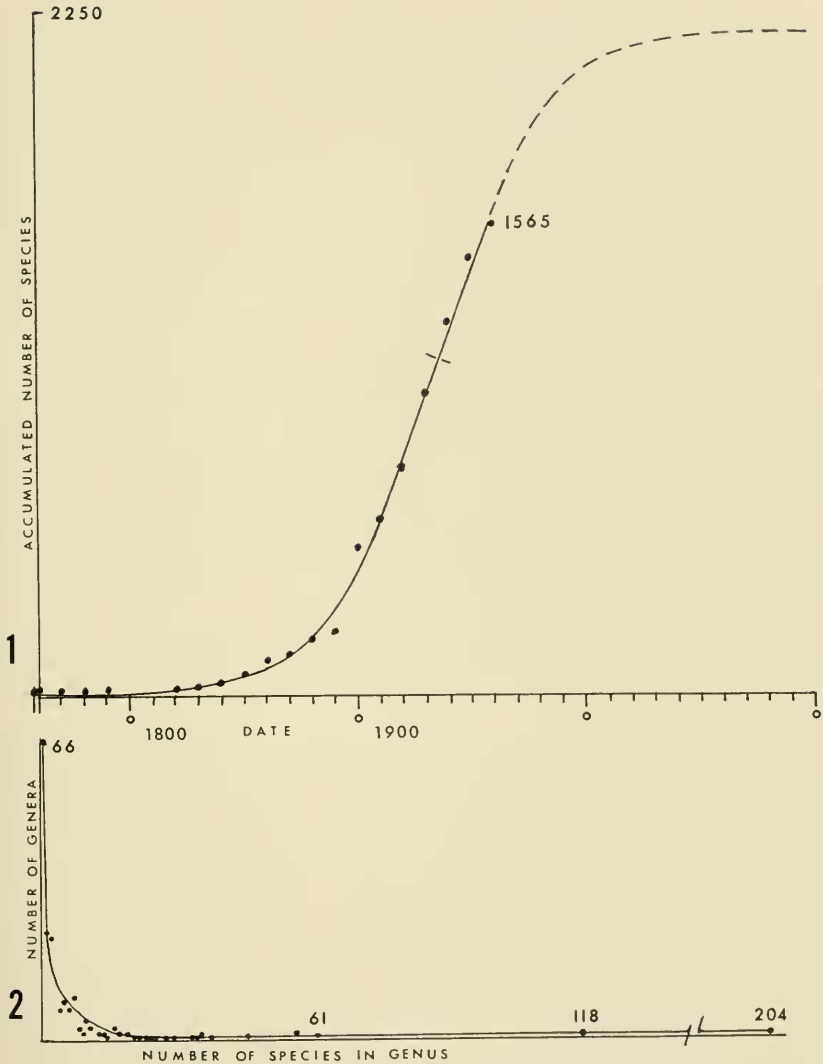


Fig. 1. Trend curve of the rate of species description in the recent Psocoptera. The number of species is given at the upper end of the curve; the bottom line (decades) begins with 1758, then 1760 and succeeding decades, with the zeroes at 1800 and 1900. Fig. 2. Species-per-genus curve for recent Psocoptera.

point the progress of their group stands, and only an analysis such as this will give a firm basis for its expression.

Another analysis, one first suggested by Willis (1922), deals with the number of species per genus. This matter was also briefly treated

by me (Steyskal, 1946). The numbers of species per genus plotted against the numbers of genera including each number of species yields a characteristic 'hollow curve' that has so far not been explained. Analysis of several groups in this manner shows that moderately large groups (families, orders) have many monotypic genera (those including but one species) and but 1 or few very large genera. The number of monotypic genera is often very roughly equal to the number of species in the largest genus. The number of species per genus as an arithmetic mean will vary from about 6 to 12, but very few genera are found to be of average size. Smith (1956) also gave averages for a number of groups of animals, reporting an average of 4 species per genus in 584 genera of insects.

The species-per-genus curve for recent Psocoptera is shown in Figure 2. The numbers of species per genus, followed in parentheses by the number of genera including each number of species are: 1 (66), 2 (24), 3 (23), 4 (7), 5 (9), 6 (7), 7 (10), 8 (3), 9 (2), 10 (4), 11 (3), 12 (2), 13 (2), 14 (1), 15 (1), 16 (3), 17 (2), 19 (2), 20, 21, 23, 24, 25, 27, 29, 33, 34 (1 each), 35 (2), 37, 45 (1 each), 56 (2), 61, 118, 204 (1 each). The average number of species per genus is 8.27. If any conclusion may be drawn from this, it is that a few genera are too large.

The nomenclatural grammar of Smithers' catalogue is better than that of many recent works, but in the interest of maximum accuracy in a work as important as a general catalogue, the following notes are offered.

1. Generic names formed with the ending *-opsis*, according to the International Code of Zoological Nomenclature (herein after referred to as "the Code"), Article 30.a.i. are of feminine gender. Therefore, the names *Seopsis*, *Sphaeropsocopsis*, *Epipsocopsis*, *Amphipsocopsis*, *Ectopsocopsis*, and *Neopsocopsis* should be feminine, and several species-names should be altered as follows: *Seopsis pavonia* and *S. termitophila* (p. 20); *Sphaeropsocopsis argentina* (p. 30); *Epipsocopsis spatulata* (p. 31); *Amphipsocopsis surculosa* (p. 54); *Ectopsocopsis annulata*, *E. aneura*, *E. mozambica*, *E. spathulata* (p. 63); *Neopsocopsis pyrenaica* (p. 95). The species-name *pavonius* is not classical, but it may be considered a Neo-Latin adjective derived from the noun *pavo* in a manner analogous to that of classical *praedonius* (from *praedo*) and *phrygionius* (from *phrygio*).

2. The following generic names are properly of the gender indicated and the species-names should be changed to the form shown below:

Thylax, m. (classical proper noun); *T. fimbriatus* (p. 3).

Nepticulomima, f.; *N. chrysomelaena* (p. 4). The form *chrysomelas* 'golden-black' is masculine.

Pteroxanium, n.; *P. funebre* (p. 9).

Psocatropos (*Psocus* + *Atropos*), f.; *P. floridana* (p. 14).

Paramphientomum, n.; *P. tristigatum* (p. 19).

Embidopsocus, m.; *E. oleaginus* (p. 23). The word *oleaginus* is a classical variant of *oleagineus* or *oleaginius*.

Neurosema (from Greek *sēma*), n.; *N. apicale* (p. 35).

Mepleres, m.; *M. solitarius* (p. 50).

Cladioneura, f.; *C. coriacea* (p. 72).

Archipsocus, m.; *A. aneurus* (p. 76).

Palmicola (see the Code, Art. 30.a.i.2, examples), m.; *P. solitarius* (p. 82).

Psocus triangulum (p. 87). The species-name *triangulum* is a classical alternative form of *triangulus* and is a noun in apposition; it therefore should not be changed to *triangulus*.

Hexacyrtoma (from Greek *kyrtōma*), n.; *H. capense* (p. 88).

Blaste, f.; *B. lithina* (p. 93).

Steleops, m.; *S. pedunculatus* (p. 114). Because the original author did not make an indication of the gender of *Steleops* (see the Code, Art. 30.a.i.2), the gender must be masculine, regardless of what its author or anyone else may have done later.

Trichadenotecnum, n.; *T. trigonosceneum* (p. 117). The species-name is evidently derived from Greek *skēnē*, and with the final *-ea* it must be an adjective. Compare the genus-name *Anopistoscena*, also by Enderlein, wherein the final eta has been changed in the classical transcriptional manner to *a*.

Thyrsopsocus, m.; *T. pulcher* (p. 119).

Phlotodes, m.; *P. corticosus*, *P. lichenosus*, *P. lyriifer* (p. 122). For the reason given above under *Steleops*, this genus-name must be masculine. It would seem that the species-name *lyriifer* ought to be *lyrififer*, but there are no rules in the Code for such a change. The species-name *longigena*, incidentally, may be considered a compound noun in apposition, formed with the noun *gena*.

3. The following family-group names require correction:

Prionoglaridae to Prionoglarididae (p. 16). The genitive of *Prionoglaris* (from Greek *glaris* 'chisel') is *prionoglaridis*.

Plaumannidae to Plaumanniidae (p. 21).

Neurostigminae to Neurostigmatinae (p. 31). The genitive of *Neurostigma* is *neurostigmatidis*.

Kolbeinae to Kolbiinae (p. 57). See *Kolbia*, below.

4. Miscellaneous errors:

Stigmatopathus horvarthi (p. 20) should be *S. horvathi* (originally written with an accent mark: *horváthi*).

Kolbia Bertkau (p. 57) was needlessly and invalidly emended to

Kolbea by Enderlein. The original spelling should be preserved and the subfamily-name based upon it should be Kolbiinae.

Pearmania usambarana (Enderlein) is the correct citation (p. 105) because Badonnel, although he used "n. sp.," did cite the Enderlein name and merely changed the status of the variety to species and described it in further detail.

5. The following notes, not calling for changes, are added by way of comment only:

Caecilius nigroticta (p. 44) is probably an error for *C. nigrotinctus*, but in the lack of a statement regarding its derivation in the original publication there is the possibility that it could be based upon a putative noun *ticta*. It should be considered a noun in apposition, as it apparently has been.

Kilauella criniger (p. 81). Names in *-ger* are sometimes, as in this case and in the classical word *armiger*, considered nouns.

Valenzuela, m. (p. 124). This genus-name is dedicated to a man, En Rafel Valenzuela, and therefore, in spite of its appearance, is masculine in gender, as its author treated it in making the name of its type-species *V. marianus*.

REFERENCES

- Smith, P. W. 1956. The number of species per genus in different animal classes in Illinois. Ill. Acad. Sci. Trans. 49: 165-171.
- Smithers, C. N. 1967. A catalogue of the Psocoptera of the World. Australian Zoologist. 14 (1): 1-145.
- Steyskal, G. C. 1946. The number of species in a genus. Entomol. News. 57: 57-58.
- . 1965. Trend curves of the rate of species description in zoology. Science. 149 (3686): 880-882.
- Willis, J. C. 1922. Age and area. Cambridge Univ. Press.